Icarus

INTERNATIONAL JOURNAL OF SOLAR SYSTEM STUDIES

Volume 40 • 1979

EDITOR: *Carl Sagan*

Laboratory for Planetary Studies
Cornell University
Ithaca, New York 14853

ACADEMIC PRESS
New York and London

A Subsidiary of Harcourt Brace Jovanovich, Publishers

Copyright © 1979 by Academic Press, Inc.

ALL RIGHTS RESERVED

No part of this publication may be reproduced or transmitted in any form or by any means, electronic or mechanical, including photocopy, recording, or any information storage and retrieval system, without permission in writing from the copyright owner.

The appearance of the code at the bottom of the first page of an article in this journal indicates the copyright owner's consent that copies of the article may be made for personal or internal use, or for the personal or internal use of specific clients. This consent is given on the condition, however, that the copier pay the stated per copy fee through the Copyright Clearance Center, Inc. (Operations Staff, P.O. Box 765, Schenectady, New York 12301), for copying beyond that permitted by Sections 107 or 108 of the U.S. Copyright Law. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works, or for resale. Copy fees for pre-1979 articles are the same as those shown for current articles.

MADE IN THE UNITED STATES OF AMERICA

CONTENTS OF VOLUME 40

NUMBER 1, OCTOBER 1979

JOSEPH A. BURNS, PHILIPPE L. LAMY, AND STEVEN SOTER. Radiation Forces on Small Particles in the Solar System 1

MARSHA R. TORR, D. G. TORR, AND R. STENCEL. Zodiacal Light Surface Brightness Measurements by Atmosphere Explorer-C 49

GEORGE W. KATTAWAR. Radiative Transfer in Spherical Shell Atmospheres. III. Application to Venus 60

RICHARD R. RADICK AND WILLIAM C. TETLEY. The 10 February 1977 Lunar Occultation of Uranus. Radius, Limb Darkening, and Polar Brightening at 6900 Å .. 67

D. GOORVITCH, E. F. ERICKSON, J. P. SIMPSON, AND A. T. TOKUNAGA. The Mean Jovian Temperature Structure Derived from Spectral Observations from 105 to 630 cm^{-1} 75

J. MAY, T. D. CARR, AND M. D. DESCH. Decametric Radio Measurement of Jupiter's Rotation Period 87

ROGER N. CLARK. Planetary Reflectance Measurements in the Region of Planetary Thermal Emission 94

D. P. CRUIKSHANK, ALAN STOCKTON, H. M. DYCK, E. E. BECKLIN, AND W. MACY JR. The Diameter and Reflectance of Triton 104

ALAN W. HARRIS AND JOSEPH A. BURNS. Asteroid Rotation. I. Tabulation and Analysis of Rates, Pole Positions and Shapes 115

A. W. HARRIS. Asteroid Rotation Rates. II. A Theory for the Collisional Evolution of Rotation Rates 145

BOOK

WILLIAM IRVINE. *The Saturn System,* Donald M. Hunten and David Morrison (Editors) 154

NUMBER 2, NOVEMBER 1979

MARK J. LUPO AND JOHN S. LEWIS. Mass–Radius Relationships in Icy Satellites . 157

AUDOUIN DOLLFUS. Optical Reflectance Polarimetry of Saturn's Globe and Rings. II. Interpretations for the B Ring 171

ROGER N. CLARK AND THOMAS B. MCCORD. Jupiter and Saturn: Near-Infrared Spectral Albedos 180

REINHARD BEER AND FREDERIC W. TAYLOR¡ Phosphine Absorption in the 5-μm Window of Jupiter 189

M. PODOLAK, N. NOY, AND A. BAR-NUN. Photochemical Aerosols in Titan's Atmosphere 193

N. NOY, A. BAR-NUN, AND M. PODOLAK. Acetylene Photopolymers in Jupiter's Stratosphere 199

PETER J. GIERASCH, ANDREU P. INGERSOLL, AND DAVID POLLARD. Baroclinic Instabilities in Jupiter's Zonal Flow 205

W. MACY, JR. On the Clouds of Uranus 213

PETER THOMAS. Surface Features of Phobos and Deimos 223

STEVEN W. SQUYRES. The Evolution of Dust Deposits in the Martian North Polar Region 244

WILLIAM M. KAULA. Equilibrium Velocities of Planetesimal Population 262

IAN JAMES SMALLEY AND DAVID H. KRINSLEY. Eolian Sedimentation on Earth and Mars: Some Comparisons 276

VINCENZO ZAPPALÁ AND I. VAN HOUTEN-GROENEVELD. Pole Coordinates of the Asteroids 9 Metis, 22 Kalliope, and 44 Nysa 289
LARRY A. LEBOFSKY AND GEORGE H. RIEKE. Thermal Properties of 433 Eros ... 297
YASUO FUKUI, SHIGERU HATA, TAKESHI MIYAJI, AND YOSHIHIRO CHIKADA. Observations of the Total Lunar Eclipse on March 24, 1978, at 3.4-mm Wavelength 309
BOOK REVIEWS 315
ERRATUM 317

NUMBER 3, DECEMBER 1979

BENJAMIN ZELLNER. Preface 319
E. F. HELIN AND E. M. SHOEMAKER. The Palomar Planet-Crossing Asteroid Survey, 1973–1978 321
F. A. FRANKLIN. Implications from the Motion of Outer Belt Asteroids 329
A. N. SIMONENKO, L. M. SHERBAUM, AND V. G. KRUCHINENKO. On the Character of Evolution of Orbits in the Vicinity of the 1:3 Kirkwood Gap 335
CHARLES F. YODER. Notes on the Origin of the Trojan Asteroids 341
H. SCHOLL. History and Evolution of Chiron's Orbit 345
GORDON H. PETTENGILL, STEVEN J. OSTRO, IRWIN I. SHAPIRO, BRIAN G. MARSDEN, AND DONALD B. CAMPBELL. Radar Observations of Asteroid 1580 Betulia 350
STEVEN J. OSTRO, GORDON H. PETTENGILL, IRWIN I. SHAPIRO, DONALD B. CAMPBELL, AND RICHARD R. GREEN. Radar Observations of Asteroid 1 Ceres 355
C. BLANCO AND S. CATALANO. UBV Photometry of Vesta 359
J. DEGEWIJ, E. F. TEDESCO, AND B. ZELLNER. Albedo and Color Contrasts on Asteroid Surfaces 364
EDWARD F. TEDESCO. The Origin of the Flora Family 375
MAHENDRA P. WIJESINGHE AND EDWARD F. TEDESCO. A Test of the Plausibility of Eclipsing Binary Asteroids 383
P. THOMAS AND J. VEVERKA. Grooves on Asteroids: A Prediction 394
EWEN A. WHITAKER. Implications for Asteroidal Regolith Properties from Comparisons with the Lunar Phase Relation and Theoretical Considerations 406
W.-H. IP. On Three Types of Fragmentation Processes Observed in the Asteroid Belt 418
A. BRAHIC, J. BRETON, J. CAUBEL, A. CAZENAVE, P. CRUVELLIER, Y. DUPUIS, B. IAGO, J. F. MINSTER, A. PERRET, AND A. SCRIBOT. Feasibility Study of a Multiple Flyby Mission of Main Belt Asteroids 423
LAUREL L. WILKENING. Asteroid Missions: Goals for Elemental Abundance Analysis 434
ELBERT A. KING AND TRUDE V. V. KING. A Model for the Internal Structures of Asteroids 439
JOHN W. LARIMER. The Condensation and Fractionation of Refractory Lithophile Elements 446
HIROSHI TAKEDA. A Layered-Crust Model of a Howardite Parent Body 455
D. W. SEARS. Did Iron Meteorites Form in the Asteroid Belt?—Evidence from Thermodynamic Models 471
FLOYD HERBERT AND CHARLES P. SONETT. Electromagnetic Heating of Minor Planets in the Early Solar System 484

Y. Benkheiri, P. Pellas, and D. Storzer. The Cooling Histories of Copiapo and Landes (IA) Irons 497
J. C. Lorin and P. Pellas. Preirradiation History of Djermaia (H) Chondritic Breccia 502
J. N. Goswami and D. Lal. Formation of the Parent Bodies of the Carbonaceous Chondrites 510
Guy J. Consolmagno. REE Patterns versus the Origin of the Basaltic Achondrites 522
Author Index for Volume 40 531
Cumulative Subject Index for Volumes 37–40 532